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# **Howmet Corporation**

**A Never Ending Journey  
To Excellence**

# Overview

**Howmet  
Castings**  
an Alcoa business



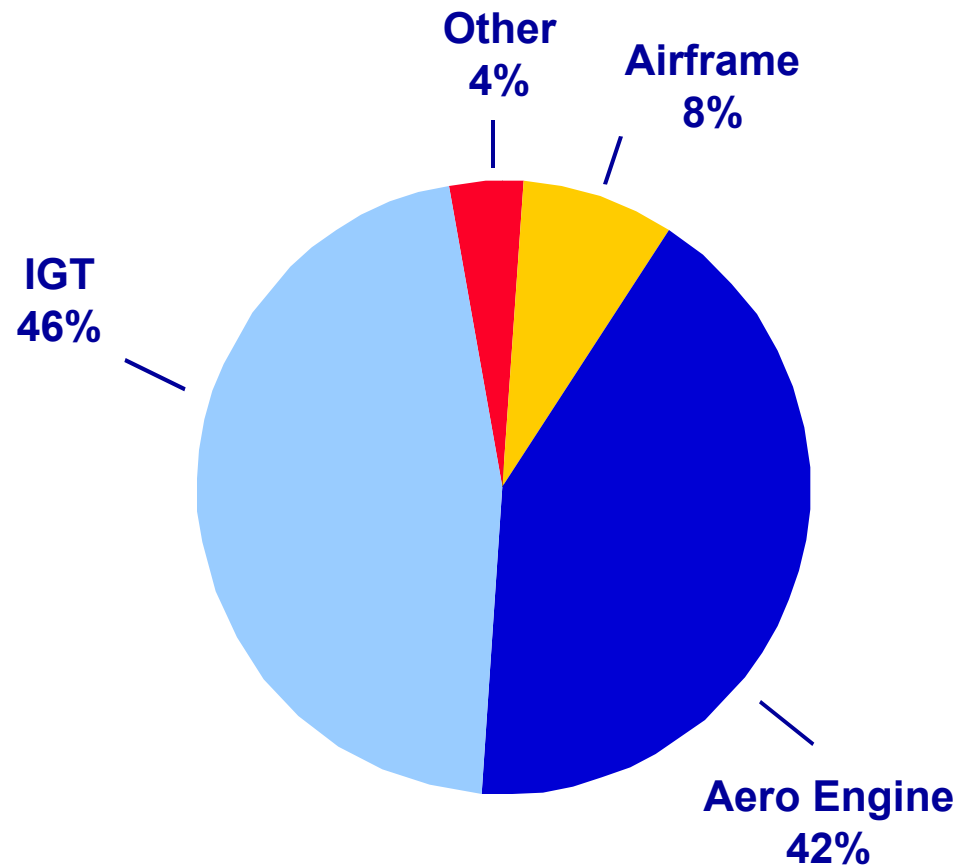
**1999 Revenue :** 1.45 billion

**Employment:** 11,500

**29 Plants, 5 Countries**

**Markets:**

- Industrial Gas Turbine
- Aerospace Airfoil
- Aerospace Structural
- Airframe Structural



**Ownership - An Alcoa Business**

# Aero Engine Products

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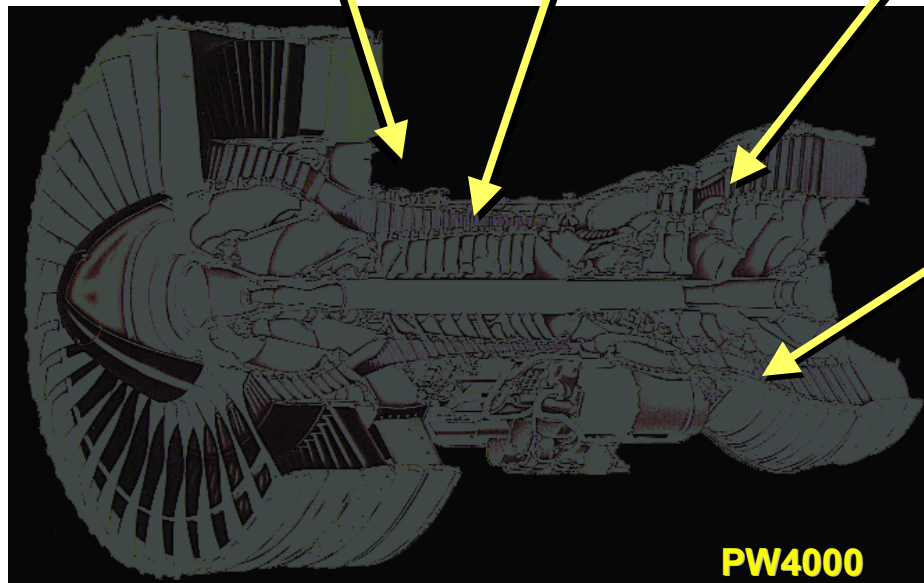
**Stator**



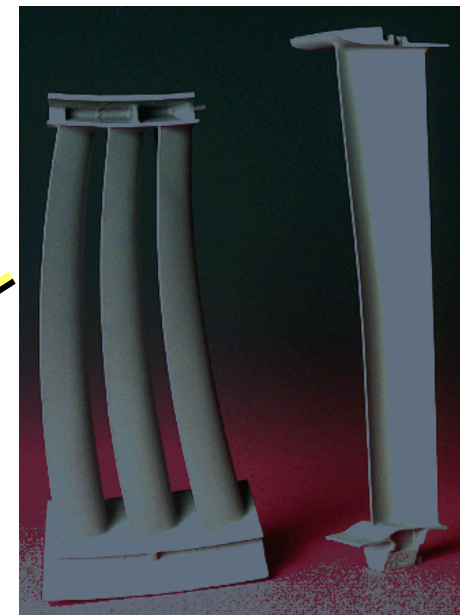
**Compressor Case**



**Hot Section Blades & Vanes**



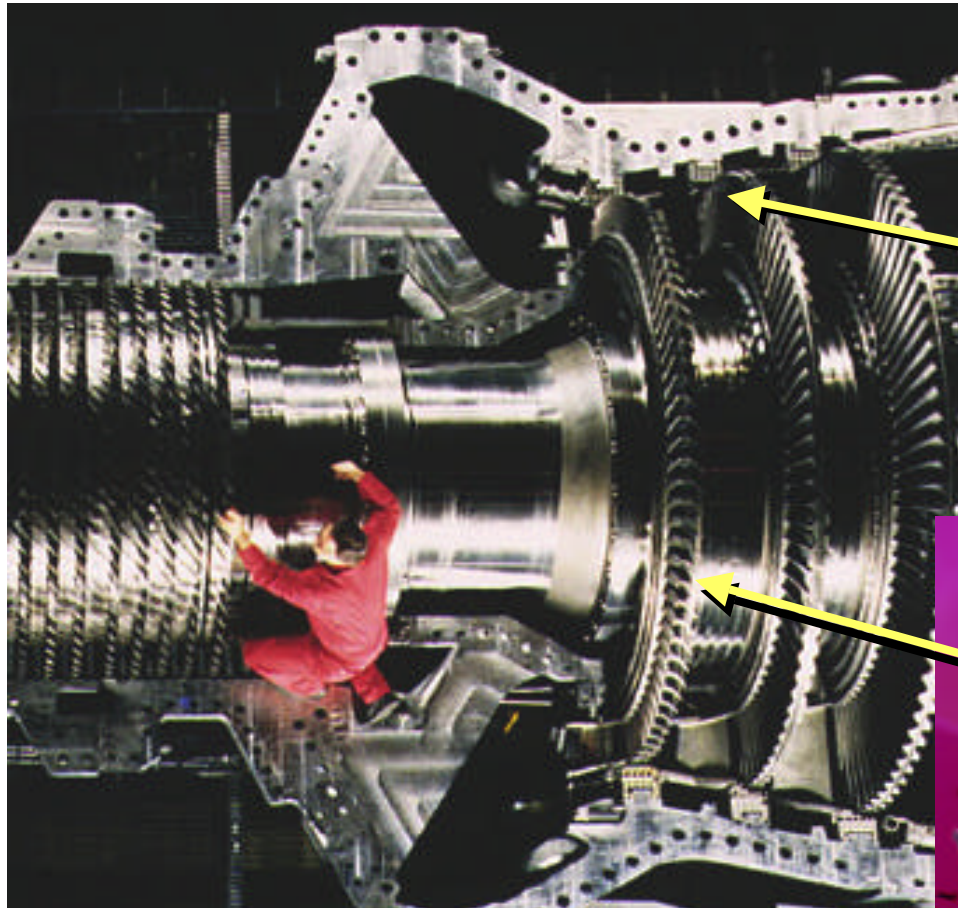
**PW4000**



**Hot  
Section  
Vane  
Segments**

# Industrial Gas Turbine Products

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**Vane  
Segment**



**Blade**

## 1980s - Good Old Days

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- Industry Leader
- Very Profitable
- Excellent Technology
- Growing
- Complacent
- Slow to Change



**H**owmet Vulnerable

## Early 1990s - Reality Check

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- **Arrogant - Unhappy customers**
- **Aero Markets in decline**
- **Competition knocking**
- **Market share eroding**
- **Cost pressure**
- **Profits in free fall**



**D**ramatic Action Necessary to Reverse Spiral

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# **CHANGE**

## **NOT OPTIONAL**



**REVOLUTIONARY CHANGE**

## BOM Team

### Business Organization Management Team

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**Objective: Identify management actions to assure dramatic and sustained improvement**

### 3 Year Goals:

#### Improve:

**Quality 50%**

**Delivery Performance 50%**

**Mfg. Lead Time 50%**

**Productivity 25%**

**Reduce Cost Base \$150M**

# Revolutionary Change

## Traditional Paradigms

## New Howmet Paradigms

**Functional Focus**

**Process Focus**

**Pyramid**

**Flat Structure**

**Hierarchy**

**Network**

**Bureaucratic**

**Flexible, responsive**

**Centralized Control**

**Empowerment**

**Management**

**Leadership**

**Supervision**

**Coaching**

**Boss-Centered**

**Customer Focused**

**Individuals**

**Teams**

**Specialized jobs**

**Broad, multi-skilled**

**Protect turf**

**Cooperation**

**Inspection**

**Prevention**

# Revolutionary Change

## Traditional Paradigms

Inventory

Ain't broke, don't fix it

Play it safe

Get it tomorrow

Decisions based on experience

People a cost

Information withheld

Training a cost

Vertical career path

## New Howmet Paradigms

Just-in-Time

Continuous improvement

Innovation

Tomorrow may not come

Decisions based on data

People a resource

Information shared

Training an investment

Horizontal career path

**Light A Fire Under People**

**Light A Fire Inside People**

# Enablers

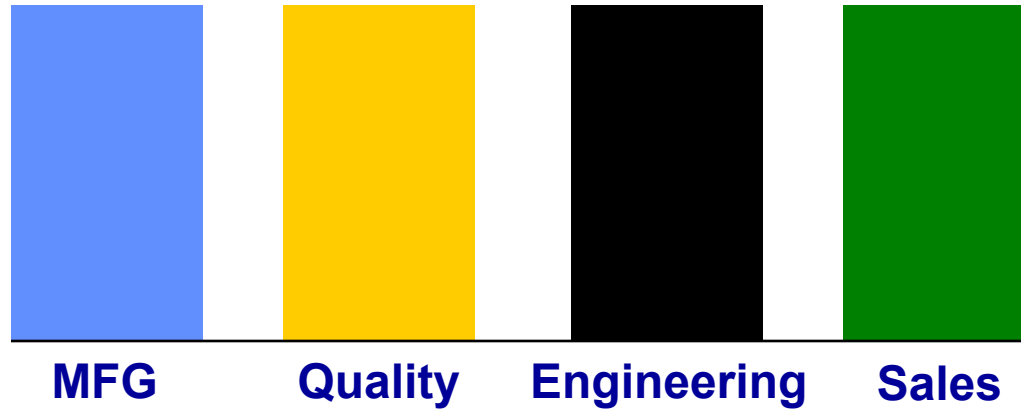
- One Howmet philosophy
- Consulting resources
- Financial transparency
- Training and communication
- Standardized measurements
- Common incentives
- Customer involvement  
and focus



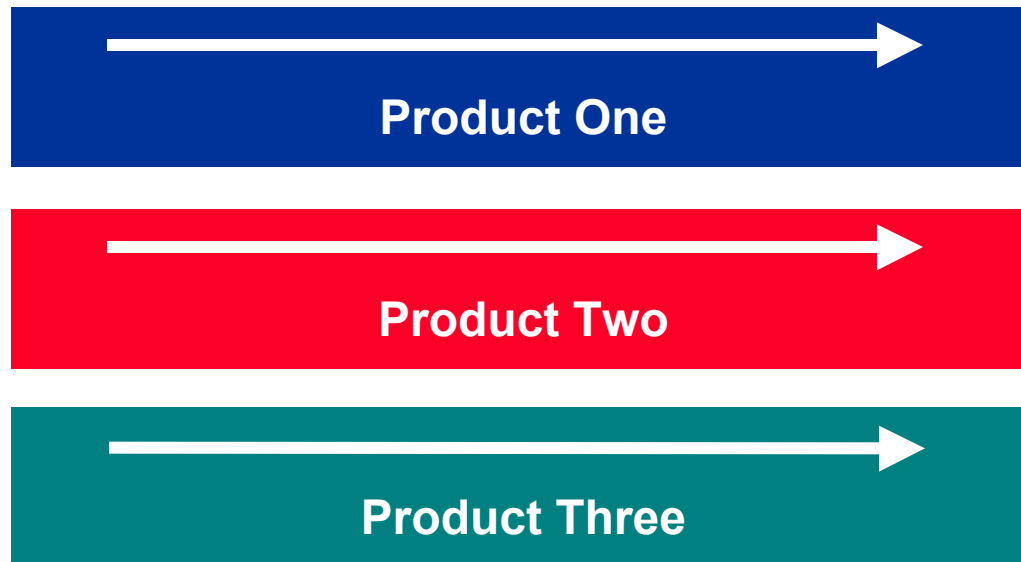
**T**ogether the Impossible Becomes Possible

# Organization Structure Key to Success

**Before**



**After**



## 1995 Thiokol/Carlyle Purchase - A Pivotal Event

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Ownership change - LBO

# CASH IS KING



## New Company

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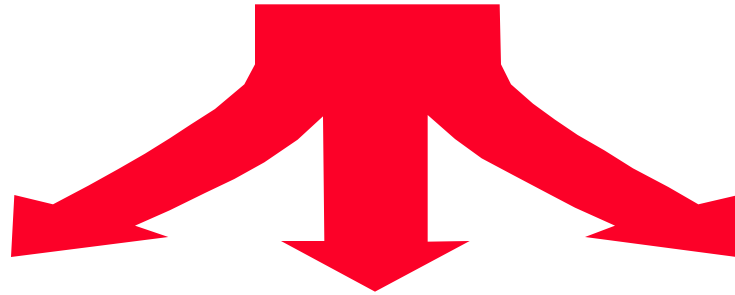
- Highly leveraged
- Customer / employee concerns
- Weak Aero market
- Growing IGT market requires capital
- Employees stretched



**N**eed for improvement never more important

## New Tools Needed

### Howmet Lean Production System



**Synchronous  
Manufacturing**

**Kaizen**

**Process  
Control/  
Six Sigma**

**Quick Shop  
Intelligence**

**Employee Involvement**

## Six Sigma at Howmet

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- Philosophy of excellence and improvement in all areas of business
- Customer focused: Based on customer needs
- Calculates process capabilities, sets goals
- Methodology for process improvement:

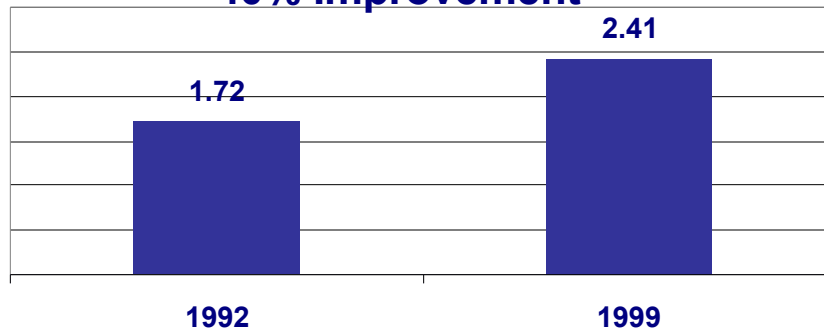
**Select, Measure, Analyze, Improve, Control (SMAIC)**

## Six Sigma Examples

<b>Project / Blackbelt</b>	<b>Initial DPMO</b>	<b>Final DPMO</b>	<b>Defect Reduction</b>
<b>Injection Scrap</b>	<b>317,536</b>	<b>48,193</b>	<b>85%</b>
<b>Mold Cracks</b>	<b>245,021</b>	<b>3.4</b>	<b>99%</b>
<b>Reducing Out-of-Spec Material</b>	<b>709,100</b>	<b>142,850</b>	<b>80%</b>

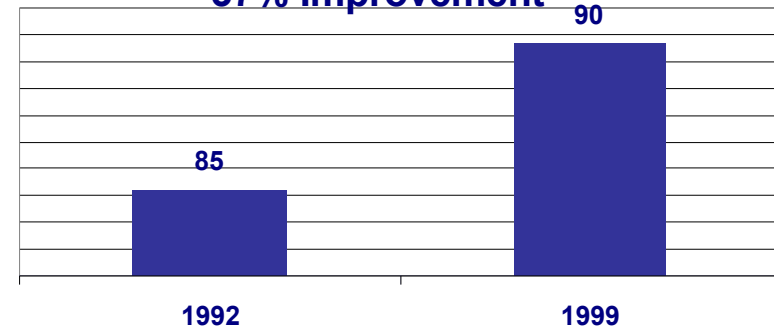
# Results - Impressive

**Productivity\***  
**40% Improvement**

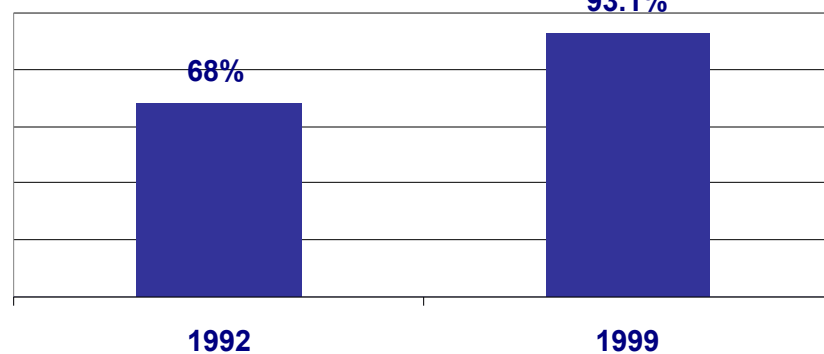


\* Added Value Sales / Employee Cost

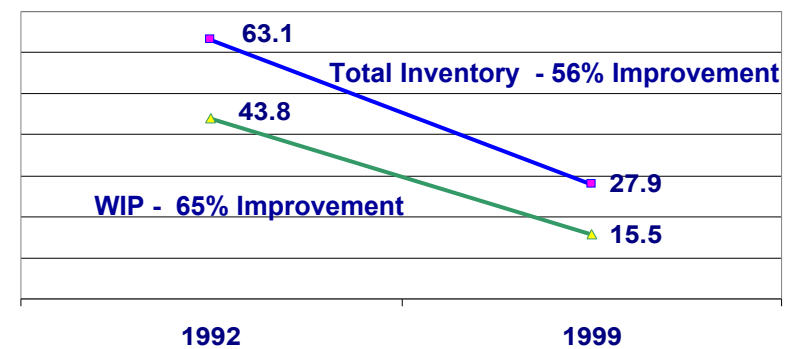
**Quality Yield**  
**37% Improvement**



**On Time Delivery**  
**78% Improvement**



**Cycle Time Days**

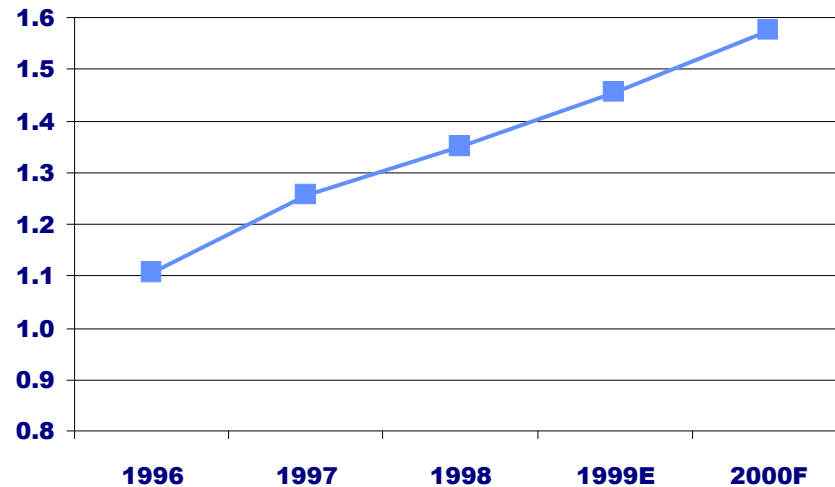


# Financial Results

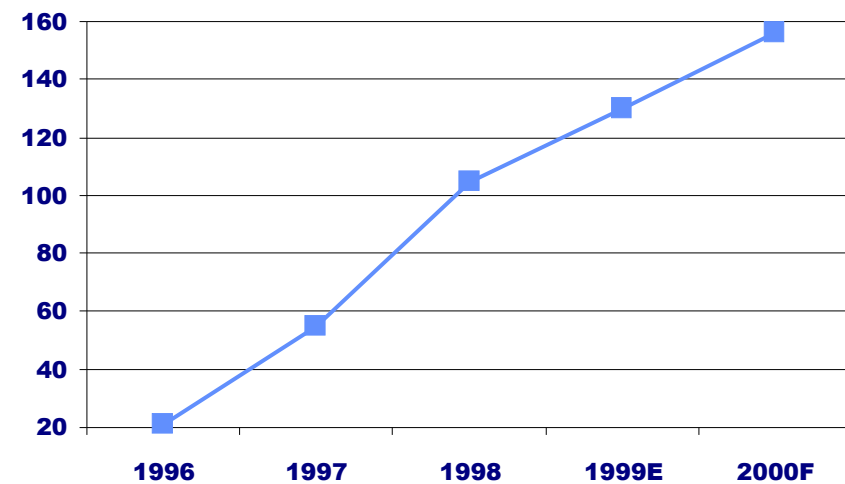
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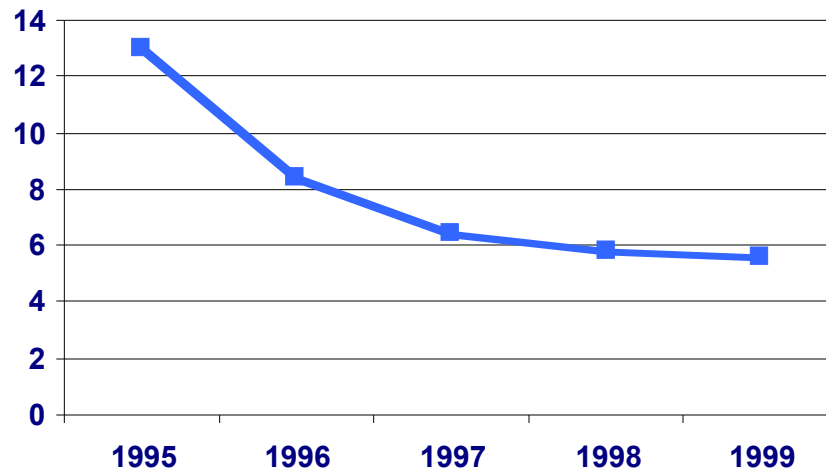
## Revenues \$B



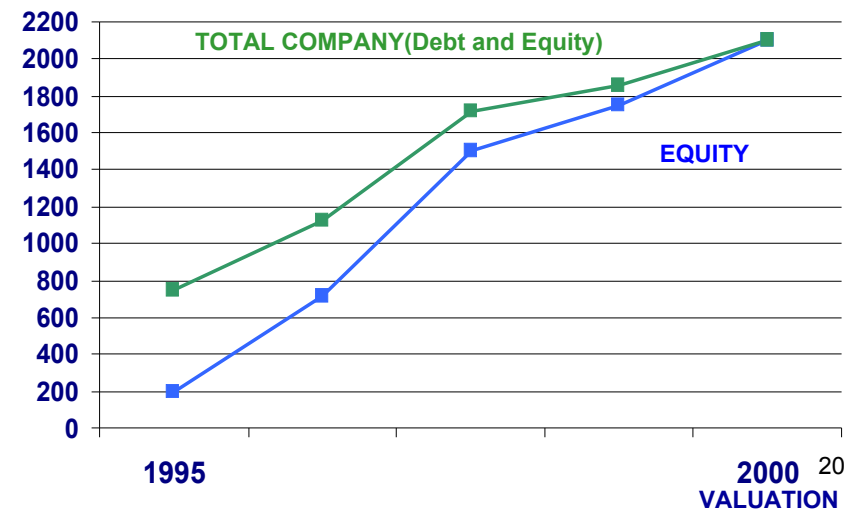
## Operational Income \$M



## Working Capital (% of Sales)



## Howmet Valuation



# Best-Managed Award

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## BEST-MANAGED COMPANIES

### "Best-Managed" United In Ability to Embrace Change

The quest for competitive advantage has been reshaping the industry landscape for much of the last 40 years, prompting aircraft companies and airlines around the world to reexamine their business models and adopt more innovative approaches to delivering the greatest value to their customers. That was in any re-  
gulation: as at least the tip of their quest today can afford to see in their boards and reject their open-



ness to the business customer base in creating com-  
petency. Depending on how well they maintain their  
best-flight positions, they could be supplanted from  
their life periods by successful rivals next year.  
United, former business, future, finally, it, Alcoa.  
It, people the up-needed players in their super-  
the category in this year's class of Competitiveness  
and replace what others have to meet.

#### Mindset Key At Howmet

New York

Howmet International Inc., which manufactures precision investment castings for jet aircraft and gas turbine engines, is not your typical third-tier supplier. "In terms of setting the right goals, keeping their eye on the ball and continuous process improvements, Howmet is a model for how it should be done in any industry," said Scott Berkman, D's an aerospace supply-chain management partner in the consulting practice of PriceWaterhouseCoopers.

That wasn't always the case. Back in 1992, manufacturing cycle time for work in progress (WIP) was 33 days, machine utilization was about 77% and quality yields on the shop floor were around 85%. Twenty nine individual plants were run autonomously, even holding against each other for customers.

To make matters worse, in 1995 \$100-million in debt was consistently pushed onto Howmet's balance sheet when Thirdco, Honeywell Technologies and Carlyle Group purchased the company from Praxair Inc. restructured. Management explained to employees the financial hole the company was in and that Howmet's future growth depended on generating as much cash as possible. The effort took hold and spread and helped install a "new Howmet philosophy," revealed



James Stanley, chief operating officer.

The company discarded profit as the overriding goal and introduced a new set of objectives: on-time delivery, quality yields, cycle time and productivity. "This is not unlike what a lot of other companies were doing at the time," said John Blinn, senior vice president and CFO. "What set Howmet apart was our ability to capture the enthusiasm of the whole organization."

At the end of 1999, quality yields were around 91%, with such process-improvement since 1993, worth about \$11 million in Howmet's bottom line. WIP cycle time was 23 days.

In just the last four years, the company has increased sales by 54%, to about \$1.5 billion, while tripling the plants of finished work. Not only has Howmet been able to generate enough cash to invest in new technology and plant expansion in that period but it's also delivered. "The lesson we've learned is that people with the right attitude can achieve unprecedented levels of competitiveness," Stanley said. ■

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## Lessons Learned

- Fast, dramatic, positive change possible
- Communication essential
- Involve everyone
- Change is hard
- Change is fun!



**J**OURNEY TO EXCELLENCE IS NEVER OVER